

10 CSR 10-5.295 Control of Emissions From Aerospace Manufacture and Rework Facilities

(1) Applicability.

- (A) This rulemaking shall apply throughout St. Louis City and Jefferson, St. Charles, Franklin, and St. Louis Counties.
- (B) The requirements of this rulemaking shall apply to all aerospace manufacture and/or rework facilities with potential emissions of volatile organic compounds exceeding twenty-five (25) tons per year.

(2) Definitions.

- (A) Definitions of individual specialty coatings specified in this rule are incorporated by reference from 40 CFR 63 Subpart GG, Appendix A, with the following modifications:
 - 1. Mold release - A coating applied to a mold surface to prevent the mold piece from sticking to the mold as it is removed, or to an aerospace component for purposes of creating a form-in-place seal.
 - 2. Caulking and smoothing compound - A semi-solid material that is used to aerodynamically smooth exterior vehicle surfaces or fill cavities such as bolt hole accesses. A material shall not be classified as a caulking and smoothing compound if it can be classified as a sealant.
- (B) Aerospace Manufacture and/or Rework Facility—Any installation that produces, reworks, or repairs in any amount any commercial, civil, or military aerospace vehicle or component.
- (C) Aerospace vehicle or component—Any fabricated part, processed part, assembly of parts, or completed unit, with the exception of electronic components, of any aircraft.
- (D) Antique aerospace vehicle or component—An aircraft or component thereof that was built at least thirty (30) years ago. An antique aerospace vehicle would not routinely be in commercial or military service in the capacity for which it was designed.

- (E) Aqueous cleaning solvent—A cleaning solution in which water is the primary ingredient (greater than eighty percent (80%) by weight of cleaning solvent solution as applied must be water). Detergents, surfactants, and bioenzyme mixtures and nutrients may be combined with the water along with a variety of additives such as organic solvents (e.g. high boiling point alcohols), builders, saponifiers, inhibitors, emulsifiers, pH buffers, and antifoaming agents. Aqueous solutions must have a flash point greater than ninety-three degrees Celsius (93°C) (two hundred degrees Fahrenheit (200°F)) (as reported by the manufacturer) and the solution must be miscible with water.
- (F) Chemical milling maskants—A coating that is applied directly to aluminum components to protect surface areas when chemical milling the component with a Type I or Type II etchant. Type I chemical milling maskants are used with a Type I etchant and Type II chemical milling maskants are used with a Type II etchant. This definition does not include bonding maskants, critical use and line sealer maskants, and seal coat maskants. Maskants that must be used with a combination of Type I or Type II etchants and any of the above types of maskants are also not included in this definition.
- (G) Energized electrical systems—Any AC or DC electrical circuit on an assembled aircraft once electrical power is connected, including interior passenger and cargo areas, wheel wells, and tail sections.
- (H) Flush cleaning—The removal of contaminants such as dirt, grease, and coatings from an aerospace vehicle or component or coating equipment by passing solvent over, into, or through the item being cleaned. The solvent may simply be poured into the item cleaned and then drained, or be assisted by air or hydraulic pressure, or by pumping. Hand-wipe cleaning operations where wiping, scrubbing, mopping, or other hand action are used are not included in this definition.
- (I) General aviation—Segment of civil aviation that encompasses all facets of aviation except air carriers, commuters, and military. General aviation includes charter and corporate-executive transportation, instruction, rental, aerial application, aerial observation, business, pleasure, and other special

uses.

- (J) General aviation rework facility—Any aerospace installation with the majority of its revenues resulting from the reconstruction, repair, maintenance, repainting, conversion, or alteration of general aviation aerospace vehicles or components.
- (K) High volume low pressure (HVLP) spray equipment—Spray equipment that is used to apply coating by means of spray gun that operates at ten pounds per square inch gauge (10.0 psig) of atomizing air pressure or less at the air cap.
- (L) Low Vapor Pressure hydrocarbon-based cleaning solvent—A cleaning solvent that is composed of a mixture of photochemically reactive hydrocarbons and oxygenated hydrocarbons and has a maximum vapor pressure of seven millimeters mercury (7 mmHg) at twenty degrees Celsius (20°C). These cleaners must not contain hazardous air pollutants.
- (M) Primer—The first layer and any subsequent layers of identically formulated coating applied to the surface of an aerospace vehicle or component. Primers are typically used for corrosion prevention, protection from the environment, functional fluid resistance, and adhesion of subsequent coatings. Primers that are defined as specialty coatings are not included under this definition.
- (N) Self-priming topcoat—A topcoat that is applied directly to an uncoated aerospace vehicle or component for purposes of corrosion prevention, environmental protection, and function fluid resistance. More than one layer of identical coating formulation may be applied to the vehicle or component.
- (O) Semi-aqueous cleaning solvent—A solution in which water is a primary ingredient (greater than sixty percent (60%) by weight of the solvent solution as applied must be water).
- (P) Specialty coating—A coating that, even though it meets the definition of a primer, topcoat, or self-priming topcoat, has additional performance criteria beyond those of primers, topcoats, and self-priming topcoats

for specific applications. These performance criteria may include, but are not limited to, temperature or fire resistance, substrate compatibility, antireflection, temporary protection or marking, sealing, adhesively joining substrates, or enhanced corrosion protection.

- (Q) Topcoat—A coating that is applied over a primer on an aerospace vehicle or component for appearance, identification, camouflage, or protection. Topcoats that are defined as specialty coatings are not included under this definition.
- (R) Touch-up and repair operation—That portion of the coating operation that is the incidental application of coating used to cover minor imperfections in the coating finish or to achieve complete coverage. This definition includes out-of-sequence or out-of-cycle coating.
- (S) Type I etchant—A chemical milling etchant that contains varying amounts of dissolved sulfur and does not contain amines.
- (T) Type II etchant—A chemical milling etchant that is a strong sodium hydroxide solution containing amines.
- (U) Definitions of certain terms specified in this rule, other than those specified in this rule section, may be found in 10 CSR 10-6.020.

(3) General Provisions.

- (A) No person shall cause, permit, or allow the emissions of volatile organic compounds (VOC) from the coating of aerospace vehicles or components to exceed—
 1. 2.9 pounds per gallon (350 grams per liter) of coating, excluding water and exempt solvents delivered to a coating applicator that applies primers. For general aviation rework facilities, the VOC limitation shall be 4.5 pounds per gallon of coating, excluding water and exempt solvents, delivered to a coating applicator that applies primers;
 2. 3.5 pounds per gallon (420 grams per liter) of

coating, excluding water and exempt solvents, delivered to a coating applicator that applies topcoats (including self-priming topcoats). For general aviation rework facilities, the VOC limit shall be 4.5 pounds per gallon (540 grams per liter) of coating, excluding water and exempt solvents, delivered to a coating applicator that applies topcoats (including self-priming topcoats);

3. The VOC content limits listed in Table I expressed in pounds per gallon of coating, excluding water and exempt solvents delivered to a coating applicator that applies specialty coatings;

Table I: Specialty Coating VOC Limitations	Pounds per gallon	Grams per liter
Ablative Coating	5.0	600
Adhesion Promoter	7.4	890
Adhesive Bonding Primers:		
Cured at 250 °F or below	7.1	850
Cured above 250 °F	8.6	1030
Adhesives:		
Commercial Interior Adhesive	6.3	760
Cyanoacrylate Adhesive	8.5	1020
Fuel Tank Adhesive	5.2	620
Nonstructural Adhesive	3.0	360
Rocket Motor Bonding Adhesive	7.4	890
Rubber-based Adhesive	7.1	850
Structural Autoclavable Adhesive	0.5	60
Structural Nonautoclaveable Adhesive	7.1	850
Antichafe Coating	5.5	660
Bearing Coating	5.2	620
Caulking and Smoothing Compounds	7.1	850
Chemical Agent-Resistant Coating	4.6	550
Clear Coating	6.0	720
Commercial Exterior Aerodynamic Structure Primer	5.4	650
Compatible Substrate Primer	6.5	780
Corrosion Prevention Compound	5.9	710
Cryogenic Flexible Primer	5.4	645
Cryoprotective Coating	5.0	600
Dry Lubricative Material	7.3	880
Electric or Radiation-Effect Coating	6.7	800
Electrostatic Discharge and Electromagnetic Interference (EMI) Coating	6.7	800
Elevated Temperature Skydrol Resistant Commercial Primer	6.2	740
Epoxy Polyamide Topcoat	5.5	660
Fire-Resistant (interior) Coating	6.7	800
Flexible Primer	5.3	640
Flight-Test Coatings:		
Missile or Single Use Aircraft	3.5	420
All Others	7.0	840
Fuel-Tank Coating	6.0	720
High-Temperature Coating	7.1	850
Insulation Covering	6.2	740
Intermediate Release Coating	6.3	750

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Lacquer	6.9	830
Maskant:		
Bonding Maskant	10.3	1230
Critical Use and Line Sealer Maskant	8.5	1020
Seal Coat Maskant	10.3	1230
Metallized Epoxy Coating	6.2	740
Mold Release	6.5	780
Optical Anti-Reflective Coating	6.3	750
Part Marking Coating	7.1	850
Pretreatment Coating	6.5	780
Rain Erosion-Resistant Coating	7.1	850
Rocket Motor Nozzle Coating	5.5	660
Scale Inhibitor	7.3	880
Screen Print Ink	7.0	840
Sealants:		
Extrudable/Rollable/Brushable Sealant	2.3	280
Sprayable Sealant	5.0	600
Silicone Insulation Material	7.1	850
Solid Film Lubricant	7.3	880
Specialized Function Coating	7.4	890
Temporary Protective Coating	2.7	320
Thermal Control Coating	6.7	800
Wet Fastener Installation Coating	5.6	675
Wing Coating	7.1	850

4. 5.2 pounds per gallon (620 grams per liter) of coating, excluding water and exempt solvents, delivered to a coating applicator that applies Type I chemical milling maskant; and
 5. 1.3 pounds per gallon (150 grams per liter) of coating, excluding water and exempt solvents, delivered to a coating applicator that applies Type II chemical milling maskants.
- (B) The emission limitations in paragraph (3)(A)1. of this rule shall be achieved by-
1. The application of low solvent coating technology where each and every coating meets the specified applicable limitation expressed in pounds of VOC per gallon of coating, excluding water and exempt solvents, stated in subsection (3)(A) of this rule;
 2. The application of low solvent coating technology where the monthly volume-weighted average VOC content of each specified coating type meets the specified applicable limitation expressed in pounds of VOC per gallon of coating, excluding water and exempt solvents, stated in subsection (3)(A) of this rule; averaging is not allowed for specialty coatings, and averaging is not allowed

between primers, topcoats (including self-priming topcoats), Type I milling maskants, and Type II milling maskants or any combination of the above coating categories; or

3. Control equipment, including but not limited to incineration, carbon adsorption and condensation, with a capture system approved by the director, provided that the owner or operator demonstrates, in accordance with subsection (5)(C), that the control system has a VOC reduction efficiency of eighty-one percent (81%) or greater.

(C) Each owner or operator of an aerospace manufacturing and/or rework operation shall apply all non-exempt primers and topcoats using one (1) or more of the application techniques specified below-

1. Flow/curtain application;
2. Dip coat application;
3. Roll coating;
4. Brush coating;
5. Cotton-tipped swab application;
6. Electrodeposition (dip) coating;
7. High volume low pressure (HVLP) spraying;
8. Electrostatic spray application; or
9. Other coating application methods that achieve emission reductions equivalent to HVLP or electrostatic spray application methods, as determined by the director.

(D) Each owner or operator of an aerospace manufacturing and/or rework operation shall ensure that all application devices used to apply primers and topcoats (including self-priming topcoats) are operated according to company procedures, local specified operating procedures, and/or the manufacturer's specifications, whichever is most stringent, at all times. Equipment modified by the owner or operator

shall maintain a transfer efficiency equivalent to HVLP or electrostatic spray application techniques.

(E) Each owner or operator of an aerospace manufacturing and/or rework operation shall comply with the following housekeeping requirements for any affected cleaning operation, unless the cleaning solvent used is an aqueous cleaning solvent, low vapor pressure hydrocarbon-based cleaning solvent, or contains less than one percent (1%) VOC by weight:

1. Solvent-laden cloth, paper, or any other absorbent applicators used for cleaning shall be placed in bags or other closed containers upon completing their use. These bags and containers must be kept closed at all times except when depositing or removing these materials from the container. The bags and containers used must be of such a design so as to contain the vapors of the cleaning solvent. Cotton-tipped swabs used for very small cleaning operations are exempt from this requirement.
2. All fresh and spent cleaning solvents, except semi-aqueous solvent cleaners, used in aerospace cleaning operations shall be stored in closed containers.
3. The handling and transfer of cleaning solvent to or from enclosed systems, vats, waste containers, and other cleaning operation equipment that hold or store fresh spent cleaning solvents shall be conducted in such a manner that spills are minimized.

(F) Each owner or operator of an aerospace manufacturing and/or rework operation utilizing hand-wipe cleaning operations excluding the cleaning of spray gun equipment performed in accordance with subsection (3)(G) shall comply with one (1) of the following:

1. Utilize cleaning solvent solutions that are classified as an aqueous cleaning solvent and/or a low vapor pressure hydrocarbon-based cleaning solvent; or
2. Utilize cleaning solvent solutions that have a

composite vapor pressure of forty five (45) mmHg or less at twenty degrees Celsius (20 °C).

- (G) Each owner or operator of an aerospace manufacturing and/or rework operation shall clean all spray guns used in the application of primers, topcoats (including self-priming topcoats), and specialty coatings utilizing one or more of the following techniques:
1. Enclosed System. Spray guns shall be cleaned in an enclosed system that is closed at all times except when inserting or removing the spray gun. Cleaning shall consist of forcing cleaning solvent through the gun. If leaks in the system are found, repairs shall be made as soon as practicable, but no later than fifteen (15) days after the leak was found. If the leak is not repaired by the fifteenth day after detection, the cleaning solvent shall be removed and the enclosed cleaner shall be shut down until the leak is repaired or its use is permanently discontinued.
 2. Nonatomized Cleaning. Spray guns shall be cleaned by placing cleaning solvent in the pressure pot and forcing it through the gun with the atomizing cap in place. No atomizing air is to be used. The cleaning solvent from the spray gun shall be directed into a vat, drum, or other waste container that is closed when not in use.
 3. Disassembled Spray Gun Cleaning. Spray guns shall be cleaned by disassembling and cleaning the components by hand in a vat, which shall remain closed at all times except when in use. Alternatively, the components shall be soaked in a vat, which shall remain closed during the soaking period and when not inserting or removing components.
 4. Atomizing Cleaning. Spray guns shall be cleaned by forcing the cleaning solvent through the gun and directing the resulting atomized spray into a waste container that is fitted with a device designed to capture the atomized cleaning solvent emissions.
- (H) Each owner or operator of an aerospace manufacturing

and/or rework operation that includes a flush cleaning operation shall empty the used cleaning solvents each time aerospace parts or assemblies, or components of a coating unit with the exception of spray guns are flush cleaned into an enclosed container or collection system that is kept closed when not in use or into a system with equivalent emission control approved by the director. Aqueous, semi-aqueous, and low vapor pressure hydrocarbon based solvent materials are exempt from the requirements of this subsection.

(I) The following activities are exempt from this section:

1. Research and development;
2. Quality control;
3. Laboratory testing activities;
4. Chemical milling;
5. Metal finishing;
6. Electrodeposition except for the electrodeposition of paints;
7. Composites processing except for cleaning and coating of composite parts or components that become part of an aerospace vehicle or component as well as composite tooling that comes in contact with such composite parts or components prior to cure;
8. Electronic parts and assemblies except for cleaning and topcoating of completed assemblies;
9. Manufacture of aircraft transparencies;
10. Wastewater treatment operations;
11. Manufacturing and rework of parts and assemblies not critical to the vehicle's structural integrity or flight performance;
12. Regulated activities associated with space vehicles designed to travel beyond the limit of the earth's atmosphere, including but not limited

to satellites, space stations, and the space shuttle;

13. Utilization of primers, topcoats, specialty coatings, cleaning solvents, chemical milling maskants, and strippers containing VOC at concentrations less than 0.1 percent for carcinogens or 1.0 percent for noncarcinogens;
 14. Utilization of touchup, aerosol can, and Department of Defense classified coatings;
 15. Maintenance and rework of antique aerospace vehicles and components; and
 16. Rework of aircraft or aircraft components if the holder of the Federal Aviation Administration design approval, or the holder's licensee, is not actively manufacturing the aircraft or aircraft components.
- (J) The requirements for primers, topcoats, specialty coatings, and chemical milling maskants specified in subsection (3)(A) of this rule do not apply to the use of low-volume coatings in these categories for which the rolling twelve (12) month total of each separate formulation used at an installation does not exceed fifty (50) gallons, and the combined rolling twelve (12) month total of all such primers, topcoats, specialty coatings, and chemical milling maskants used does not exceed two hundred (200) gallons. Coatings exempted under subsection (3)(I) of this rule are not included in the fifty (50) and two hundred (200) gallon limits.
- (K) The following situations are exempt from the requirements of subsections (3)(D) and (3)(E);
1. Any situation that normally requires the use of an airbrush or an extension on the spray gun to properly reach limited access spaces;
 2. The application of any specialty coating;
 3. The application of coatings that contain fillers that adversely affect atomization with HVLP spray guns and that cannot be applied by any of the

application methods specified in subsection (3)(C) of this rule;

4. The application of coatings that normally have dried film thickness of less than 0.0013 centimeter (0.0005 in.) and that cannot be applied by any of the application methods specified in subsection (3)(C) of this rule;
5. The use of airbrush application methods for stenciling, lettering, and other identification markings;
6. The use of hand-held spray can application methods; and
7. Touch-up and repair operations.

(L) The following cleaning operations are exempt from the requirements of subsection (3)(F) of this rule:

1. Cleaning during the manufacture, assembly, installation, maintenance, or testing of components of breathing oxygen systems that are exposed to the breathing oxygen;
2. Cleaning during the manufacture, assembly, installation, maintenance, or testing of parts, subassemblies, or assemblies that are exposed to strong oxidizers or reducers (e.g., nitrogen tetroxide, liquid oxygen, or hydrazine);
3. Cleaning and surface activation prior to adhesive bonding;
4. Cleaning of electronic parts and assemblies containing electronic parts;
5. Cleaning of aircraft and ground support equipment fluid systems that are exposed to the fluid including air-to-air heat exchangers and hydraulic fluid systems;
6. Cleaning of fuel cells, fuel tanks, and confined spaces;
7. Surface cleaning of solar cells, coating optics,

and thermal control surfaces;

8. Cleaning during fabrication, assembly, installation, and maintenance of upholstery, curtains, carpet, and other textile materials used in the interior of the aircraft;
9. Cleaning of metallic and non-metallic materials used in honeycomb cores during the manufacture or maintenance of these cores, and cleaning of the completed cores used in the manufacture or maintenance of aerospace vehicles or components;
10. Cleaning of aircraft transparencies, polycarbonate, or glass substrates;
11. Cleaning and solvent usage associated with research and development, quality control, and laboratory testing;
12. Cleaning operations, using nonflammable liquids, conducted within five (5) feet of energized electrical systems; and
13. Cleaning operations identified as essential uses under the Montreal Protocol for which the U.S. Environmental Protection Agency has allocated essential use allowances or exemptions.

(4) Reporting and Record Keeping.

(A) Monitoring Requirements - Each owner or operator of an aerospace manufacturing and/or rework operation shall submit a monitoring plan to the director that specifies the applicable operating parameter value, or range of values, to ensure ongoing compliance with paragraph (3)(B)3. of this rule. Any monitoring device, required by the monitoring plan, shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's specifications.

(B) Recordkeeping Requirements

1. Each owner or operator of an aerospace manufacture and/or rework operation that applies coatings listed in subsection (3)(A) of this rule shall:

- A. Maintain a current list of coatings in use with category and VOC content as applied;
 - B. Record each coating volume usage on a monthly basis; and
 - C. Maintain records of monthly volume-weighted average VOC content for each coating type included in averaging for coating operations that achieve compliance through coating averaging under paragraph (3)(B)2. of this rule.
2. Each owner or operator of an aerospace manufacture and/or rework operation that uses cleaning solvents subject to this rule shall:
- A. Maintain a list of materials with corresponding water contents for aqueous and semi-aqueous hand-wipe cleaning solvents;
 - B. Maintain a current list of cleaning solvents in use with their respective vapor pressure or, for blended solvents, VOC composite vapor pressure for all vapor pressure compliant hand-wipe cleaning solvents. This list shall include the monthly amount of each applicable solvent used; and
 - C. Maintain a current list of exempt hand-wipe cleaning processes for all cleaning solvents with a vapor pressure greater than 45 mm Hg used in exempt hand-wipe cleaning operations. This list shall include the monthly amount of each applicable solvent used.
- (C) All records must be kept on site for a period of five (5) years and made available to the department upon request.
- (5) Test Methods.
- (A) An owner or operator of an aerospace manufacture and/or rework operation shall determine compliance for coatings which are not waterborne (water-reducible), determine the VOC content of each formulation less water and less exempt solvents as applied using

manufacturer's supplied data or Method 24 of 40 CFR part 60, Appendix A. If there is a discrepancy between the manufacturer's formulation data and the results of the Method 24 analysis, compliance shall be based on the results from the Method 24 analysis. For waterborne (water reducible) coatings, manufacturer's supplied data alone can be used to determine the VOC content of each formulation.

- (B) An owner or operator of an aerospace manufacture and/or rework operation shall determine compliance for cleaning solvents using the following:
 - 1. For aqueous and semiaqueous cleaning solvents manufacturers' supplied data shall be used to determine the water content; or
 - 2. For hand-wipe cleaning solvents required in subsection (3)(F) of this rule, manufacturers' supplied data or standard engineering reference texts or other equivalent methods shall be used to determine the vapor pressure or VOC composite vapor pressure for blended cleaning solvents.

- (C) An owner or operator of an aerospace manufacture and/or rework operation electing to demonstrate compliance with this rule by use of control equipment meeting the requirements of paragraph (3)(B)3., shall demonstrate the required capture efficiency in accordance with EPA methods 18, 25, and/or 25A in 40 CFR 60, Appendix A.

